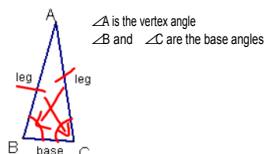
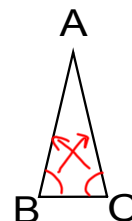
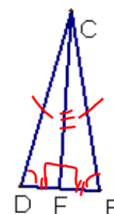


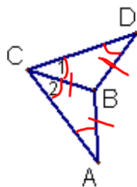
## 4.6 Isosceles Triangle Theorem

 $\triangle ABC$  is isosceles

$\overline{AB} \cong \overline{AC}$

Isosceles  $\triangle$  Theorem-(Theorem 4.9) If 2 sides of a  $\triangle$  are  $\cong$ , then the angles opposite those sides are  $\cong$ . (I  $\Delta$  thm.)Since  $\overline{AB} \cong \overline{AC}$ , then  $\angle C \cong \angle B$ The Converse of the Isosceles  $\triangle$  Theorem-(Theorem 4.10) If 2 angles of a  $\triangle$  are  $\cong$ , then the sides opposite those angles are  $\cong$ .Since  $\angle C \cong \angle B$ , then  $\overline{AB} \cong \overline{AC}$ Corollary 4.3-A  $\triangle$  is equilateral iff it is equiangularCorollary 4.4-Each angle of an equilateral  $\triangle$  measures  $60^\circ$ .\*\*\*\*The altitude of an isosceles  $\triangle$  is  $\perp$  to the base at its midpoint.If  $\overline{CF}$  is the altitude from the vertex angle, then  $DF = FE$  and  $m\angle CFE = 90^\circ$ Why?  $\triangle DFC \cong \triangle EFC$  by HL

## Proof Examples:

Given:  $AB = CB = BD$  $\angle 2 \cong \angle 1$ Prove:  $\angle A \cong \angle D$ 

S.

$$\textcircled{1} AB = CB = BD$$

 $\angle 2 \cong \angle 1$ 

$$\textcircled{2} \angle 2 \cong \angle A$$

$$\angle 1 \cong \angle D$$

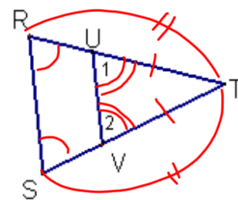
$$\textcircled{3} \angle A \cong \angle D$$

R.

$$\textcircled{1} \text{ Given}$$

$$\textcircled{2} \text{ I } \Delta \text{ thm}$$

$$\textcircled{3} \text{ Subst.}$$

Given:  $\angle R \cong \angle S$ Prove:  $\overline{RU} \cong \overline{SV}$ 

S.

$$\textcircled{1}$$

$$\textcircled{2} \overline{UT} \cong \overline{VT}$$

$$\overline{RT} \cong \overline{TS}$$

$$\textcircled{3} RT = RU + UT$$

$$TS = SV + VT$$

$$\textcircled{4} RU + UT = SV + VT$$

$$\textcircled{5} RU = SV$$

$$\textcircled{6} \overline{RU} \cong \overline{SV}$$

R.

$$\textcircled{1} \text{ Given}$$

$$\textcircled{2} \text{ Conv. I } \Delta \text{ thm.}$$

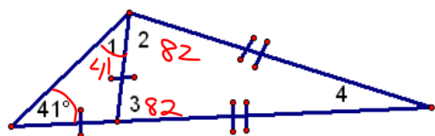
$$\textcircled{3} \text{ Segm + Post.}$$

$$\textcircled{4} \text{ Subst.}$$

$$\textcircled{5} \text{ Subtr}$$

$$\textcircled{6} \text{ def of } \cong$$

Find the measures of the numbered angles.



$$m\angle 1 = 41$$

$$m\angle 3 = 82$$

$$m\angle 2 = 82$$

$$m\angle 4 = 16$$

$$\begin{array}{r} 180 \\ - 164 \\ \hline \end{array}$$

HW

p219-220 #s 9-14, 19-26